

Snowdens Mill/Falling Creek Stream Restoration



Public Meeting
January 23, 2018

Introductions



- Beth Forbes, PE
 - Project Manager, Montgomery County DEP/JV
- Miranda Reid
 - Watershed Planner, Montgomery County DEP
- Lucia Noya, PE
 - Project Manager, Rummel, Klepper & Kahl, LLP (RK&K)
- Jason Coleman, PE
 - Project Designer, Rummel, Klepper & Kahl, LLP (RK&K)



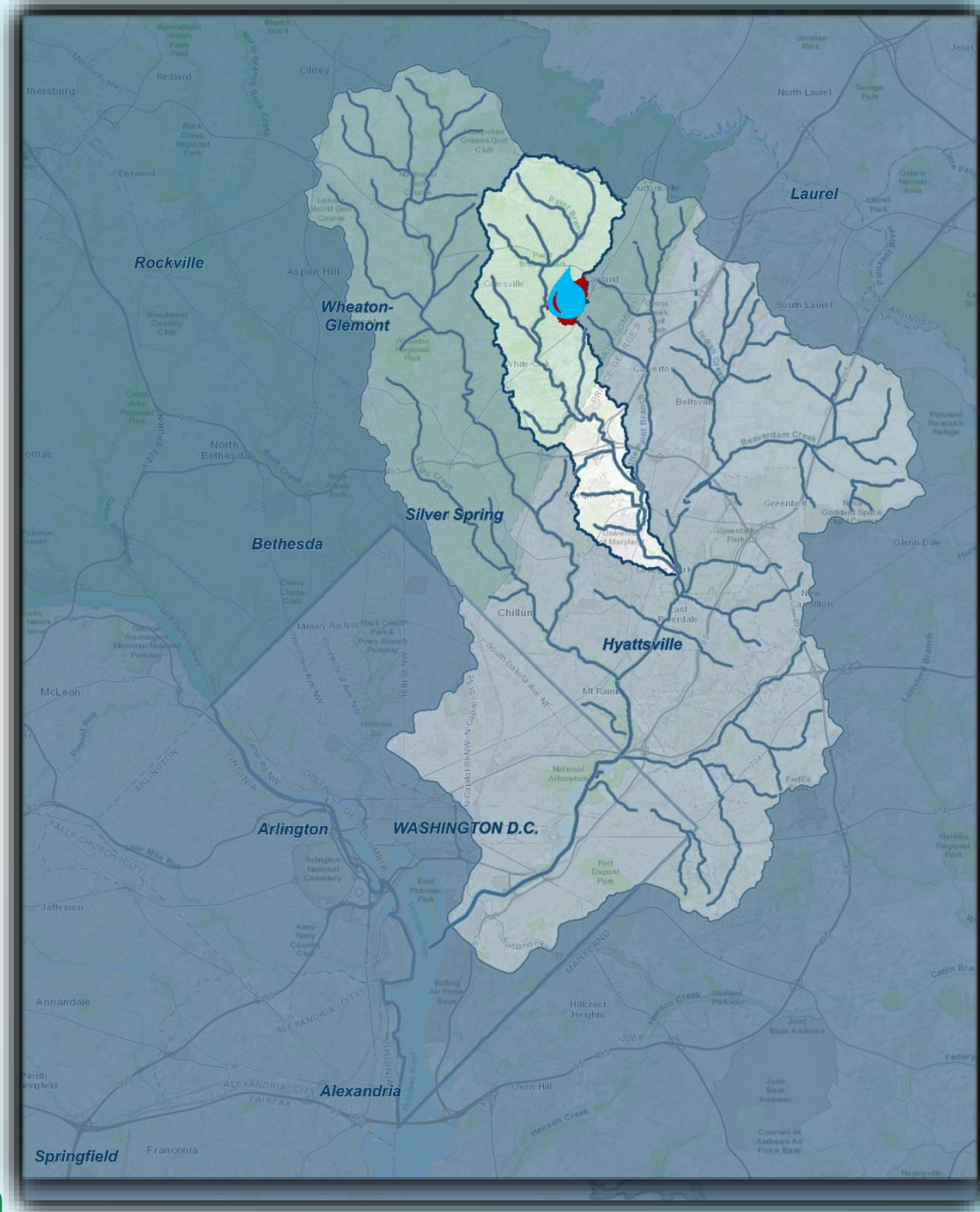
Today's Agenda



- Watershed Management Overview
- Project Background
- Existing Conditions
- Restoration Design and Approach
- Construction: What to Expect
- Project Schedule and Next Steps

What is a Watershed?

- A **watershed** is an area from which the water above and below ground drains to the same place.
- Different scales of watersheds:
 - Chesapeake Bay
 - Potomac River
 - Anacostia River
 - Paint Branch
 - Snowdens Mill
 - Neighborhood-to a storm drain



Paint Branch Watershed

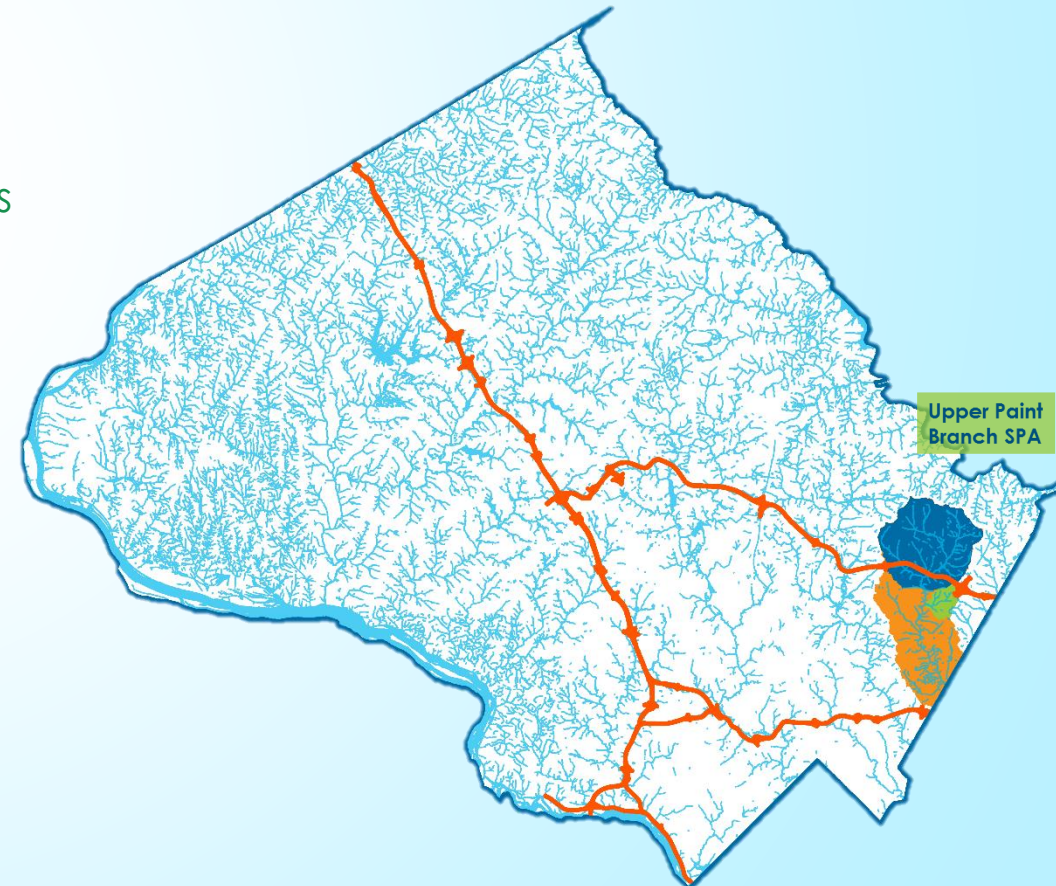


- ▶ **Paint Branch is a Class III Stream**

- ▶ Growth and propagation of brown trout

- ▶ **Special Protection Area (SPA)**

- ▶ High-quality/sensitive water resources or environmental features
- ▶ Resources threatened by land use changes such as development
- ▶ Developers must follow strict requirements
- ▶ 10% Impervious cap



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What is Runoff?

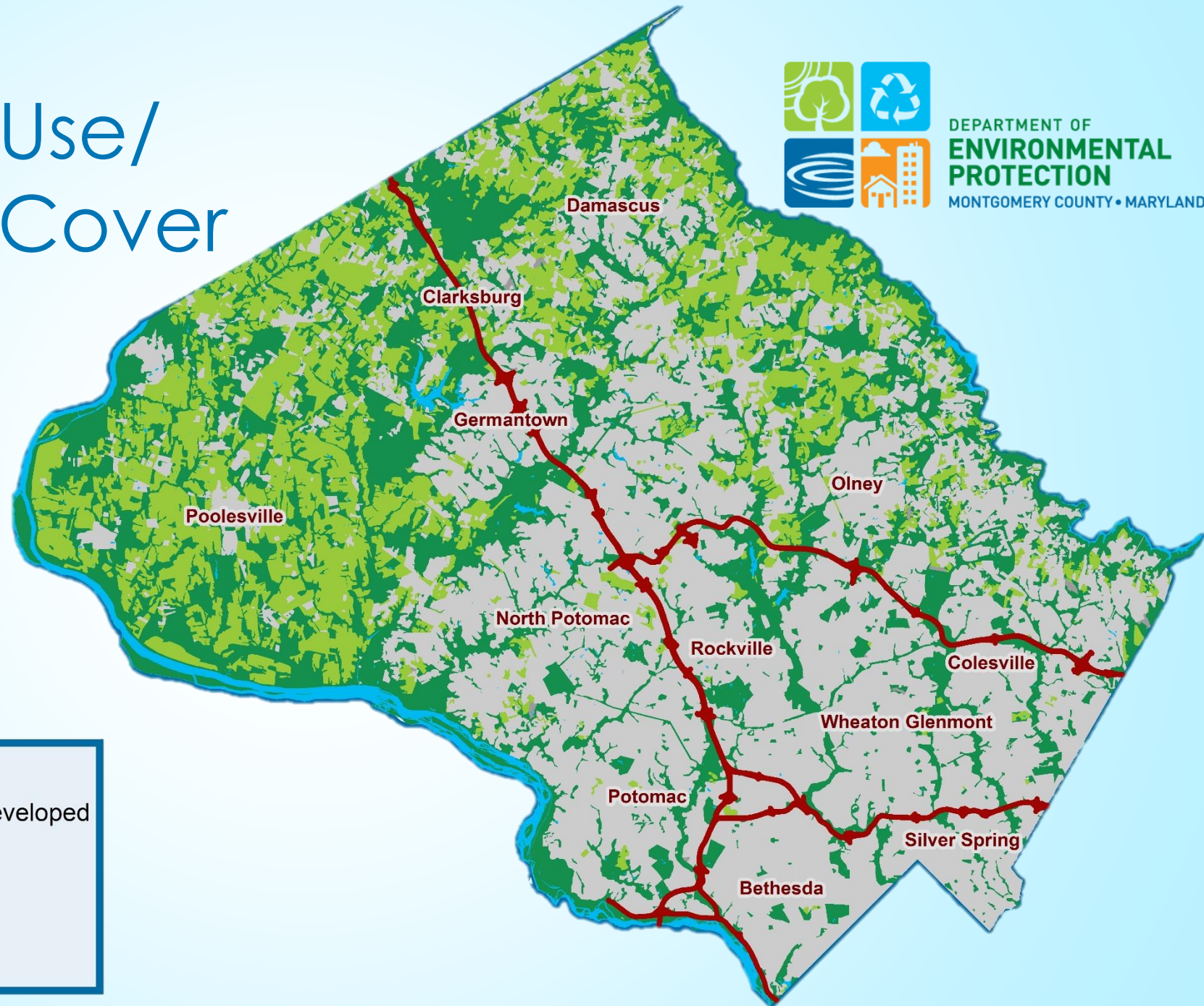
Water that does not soak into the ground becomes surface runoff. This runoff flows over **impervious** surfaces like rooftops, driveways and parking lots collecting potential contaminants and flows:

- Directly into streams
- Into storm drain pipes, eventually leading to streams
- Into stormwater management facilities, then streams

Two Major Issues:
Volume/Timing of Runoff
Water Quality



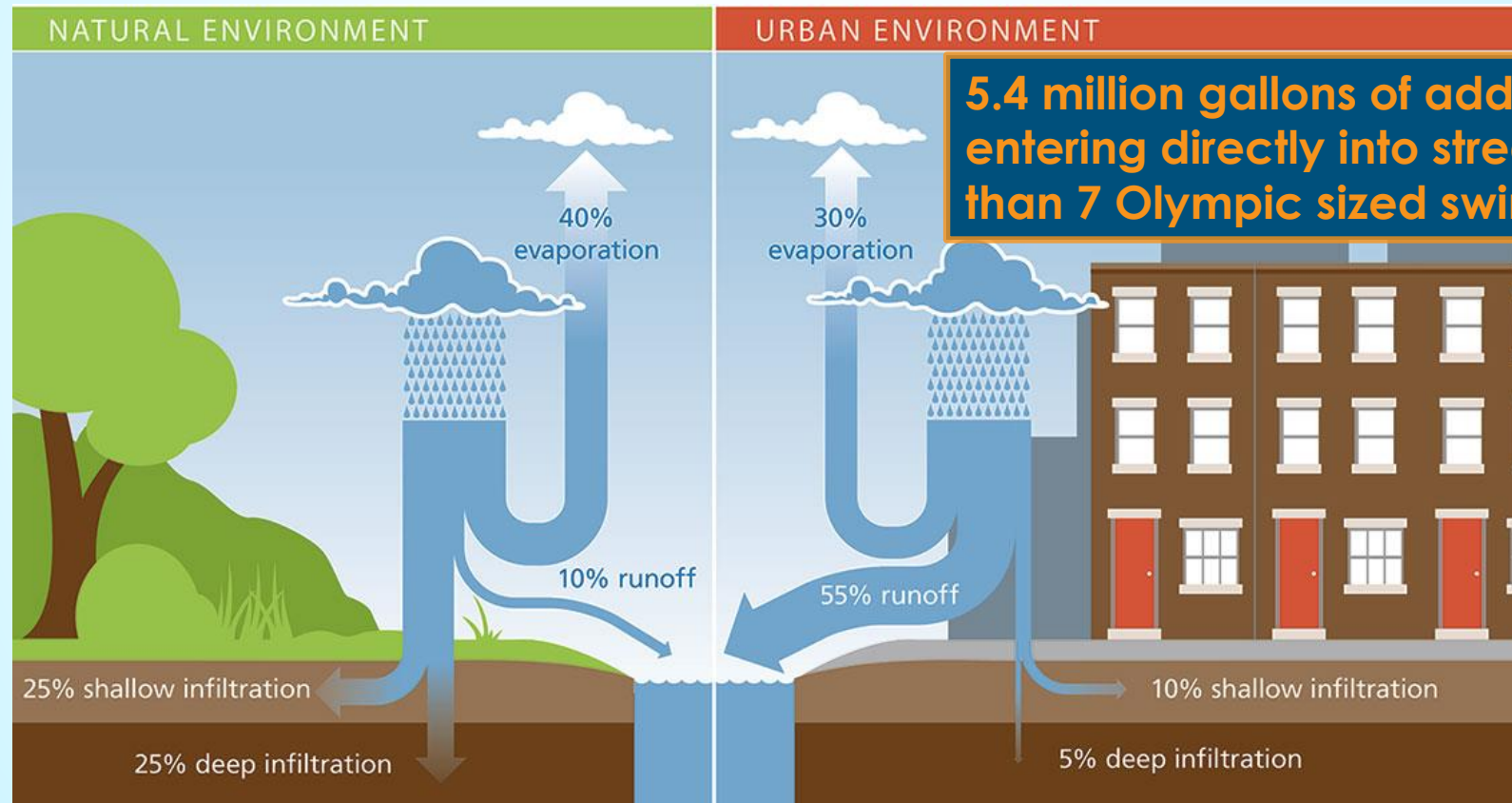
Land Use/ Land Cover



Land Use

-  Natural/Undeveloped
-  Agricultural
-  Developed
-  Water

Runoff



5.4 million gallons of additional water entering directly into streams! That's more than 7 Olympic sized swimming pools!

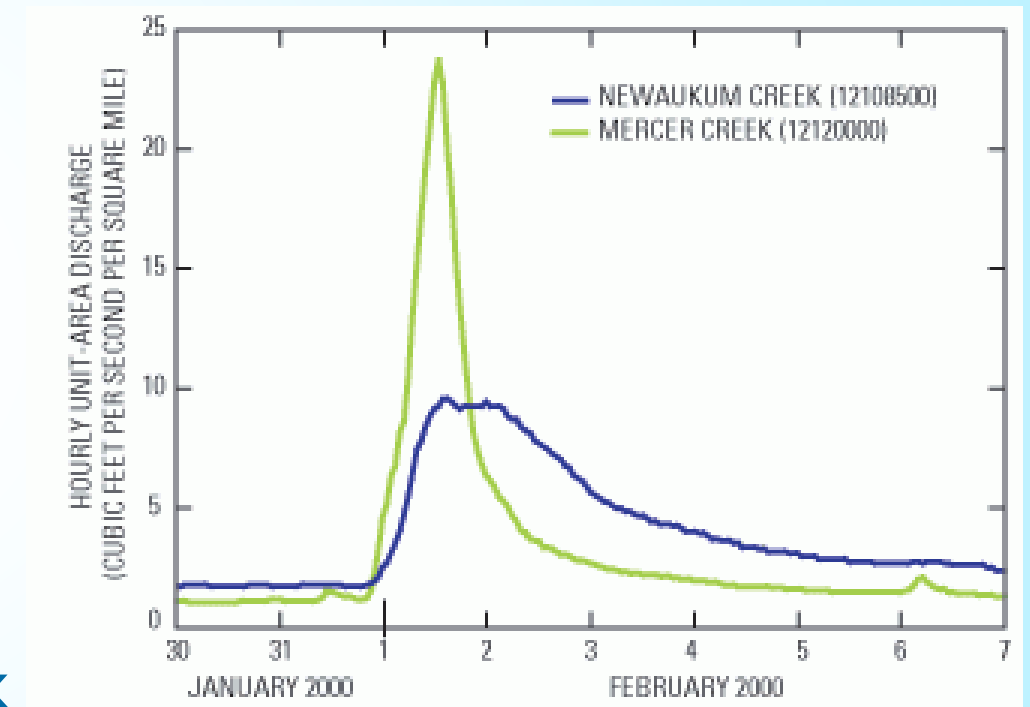
Urban vs. Forested Watersheds

► Urban Mercer Creek

- Streamflow increases more quickly
- Higher Peak Flow
- Lower Baseflow
- Flash Floods
- Increased Erosion

► Forested Newaukum Creek

- Lower peak flow – slower to rise
- Higher base flow during periods of no rain → Supports fish

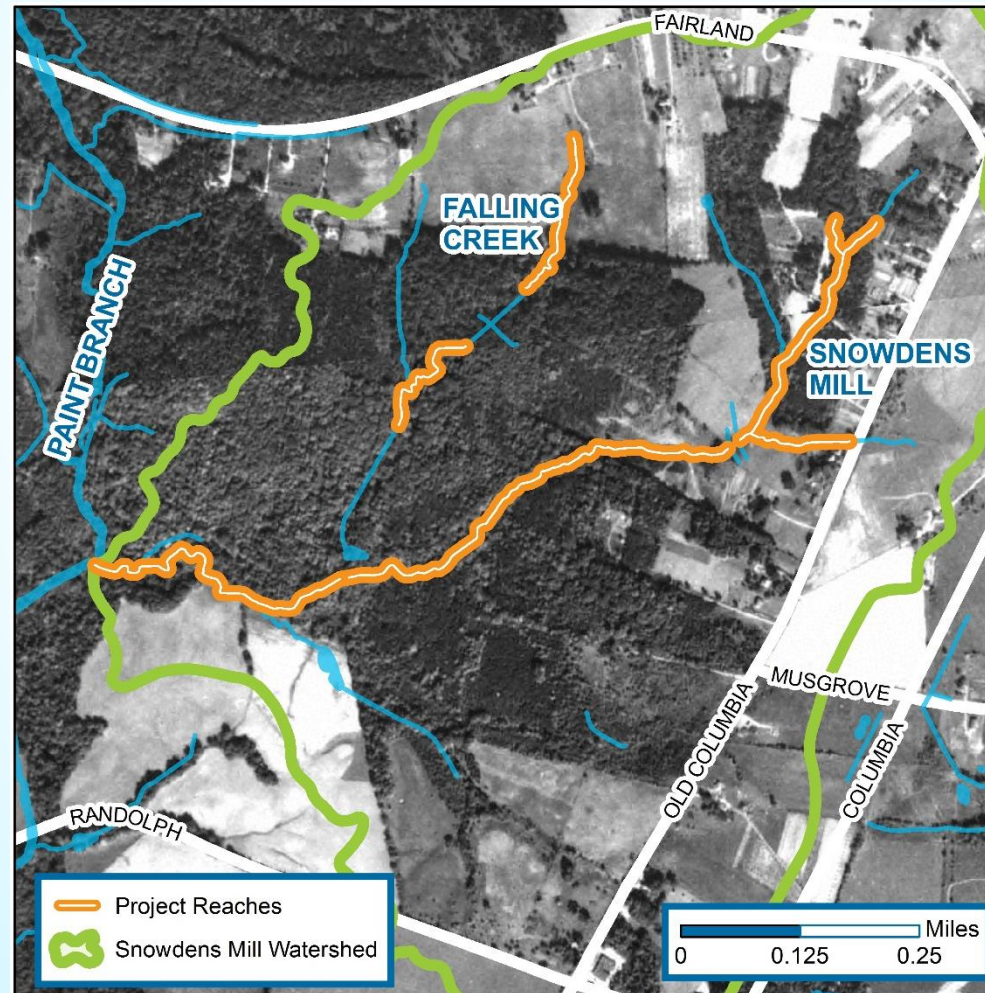


USGS

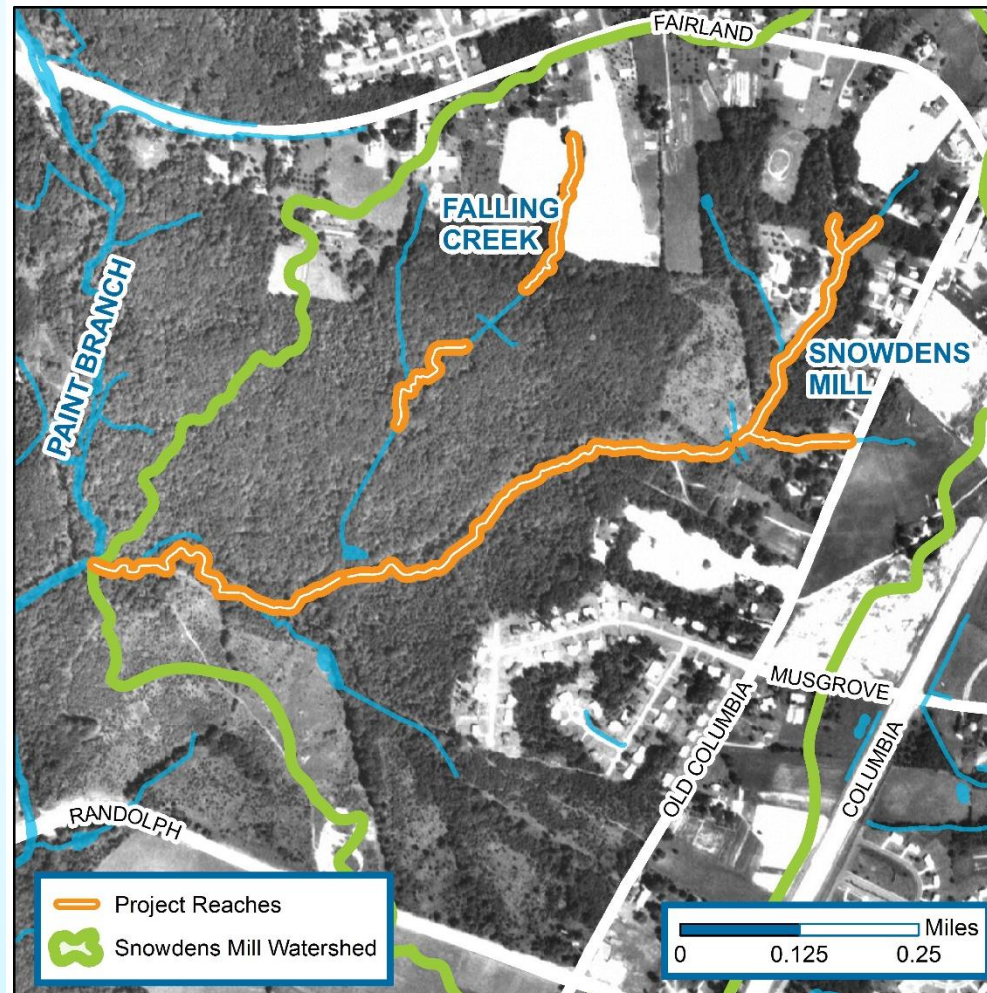
Land Use Change



Historic Aerial - 1951



Historic Aerial - 1970



Historic Aerial - 1979



Historic Aerial - 1993

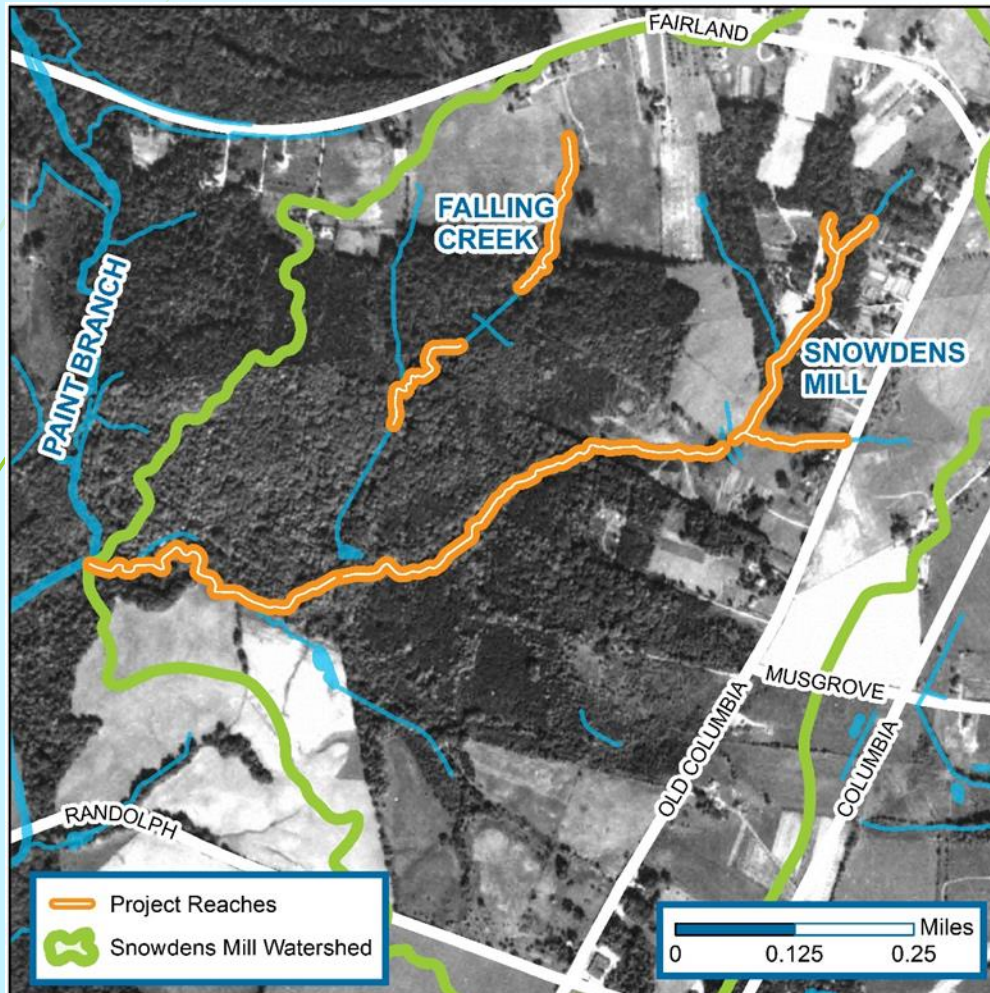


Historic Aerial - 2017

26% Impervious



Historic Aerial - 2017



Watershed 101

Impervious Surface Impacts to Streams



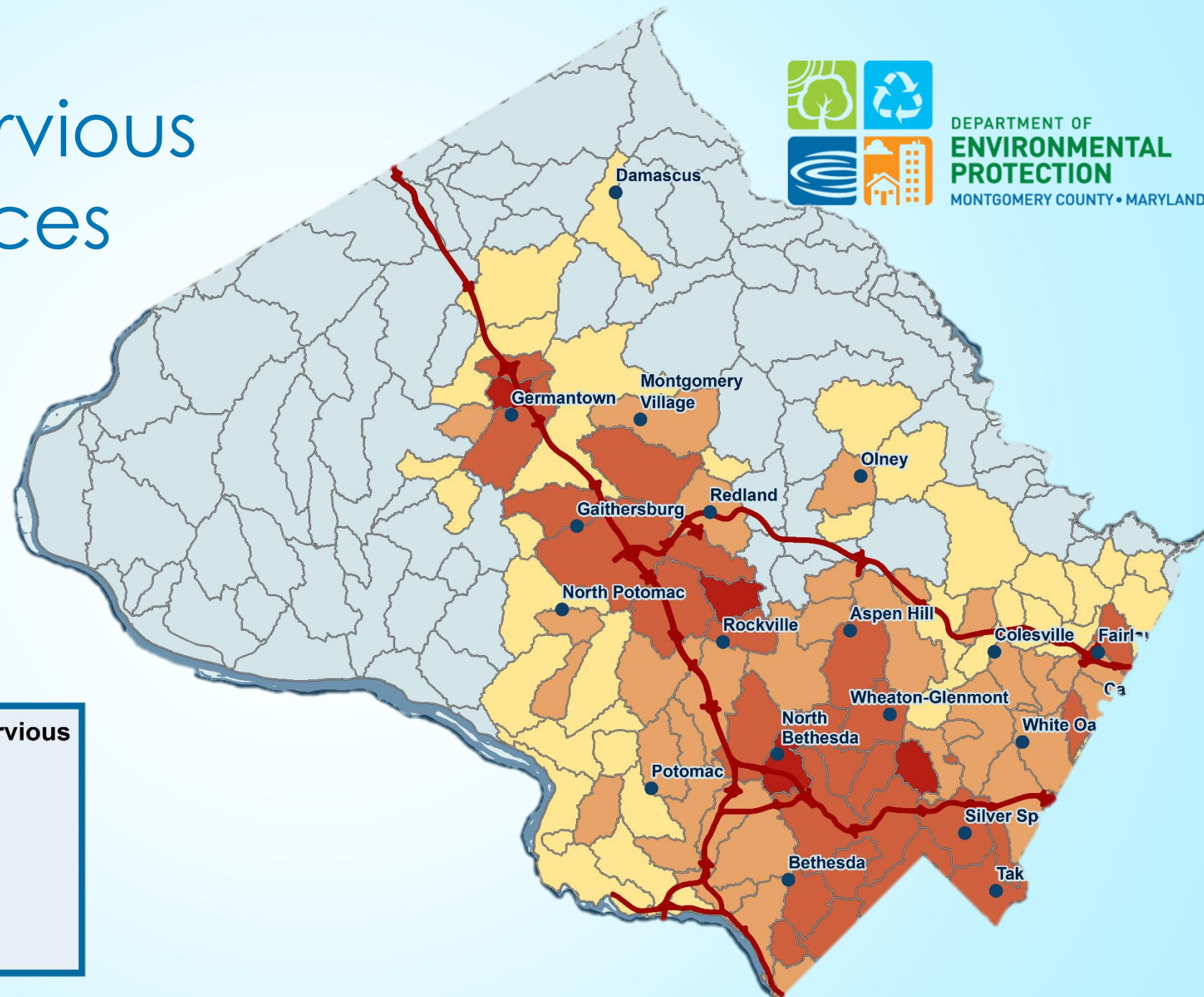
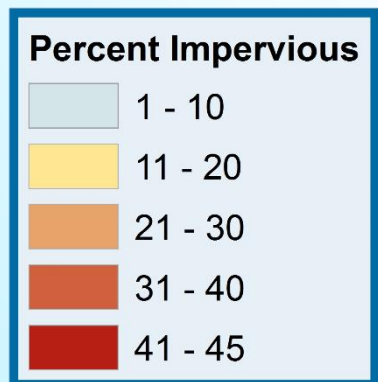
Stream in a watershed with **8%** impervious cover.

Stream in a watershed with **20%** impervious cover.

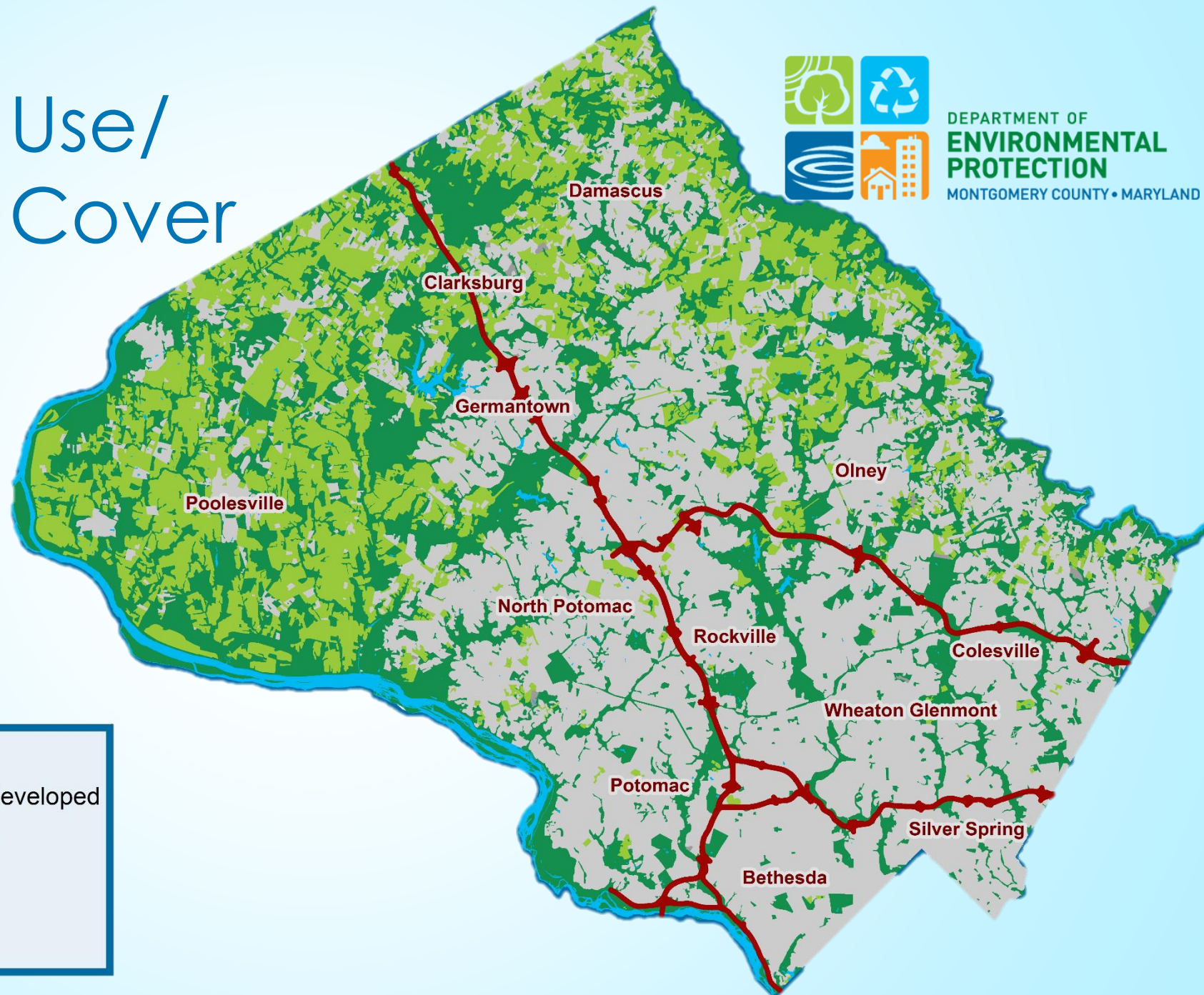


Stream in a watershed with **30%** impervious cover.

Impervious Surfaces



Land Use/ Land Cover



Land Use

-  Natural/Undeveloped
-  Agricultural
-  Developed
-  Water

Habitat 101

Riffle/Pool Habitat & Good Baseflow



Poor/Low Baseflow

Habitat 101



Riffle Habitat

- Oxygenation
- Benthic Invertebrates
- Fish Spawning



Embeddedness

- Sediment fills in riffles
- Low oxygen for organisms
- Poor habitat for benthics and fish

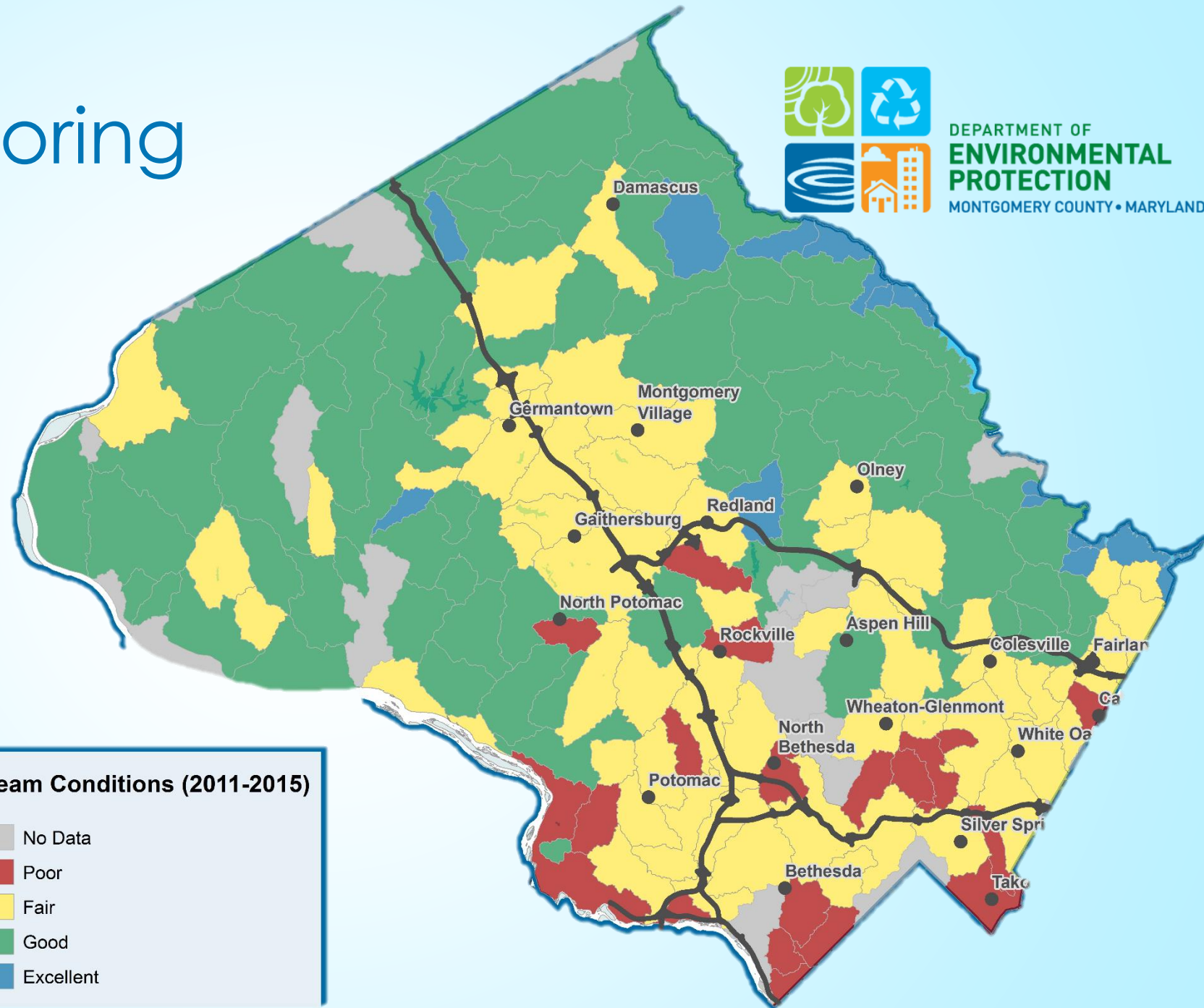
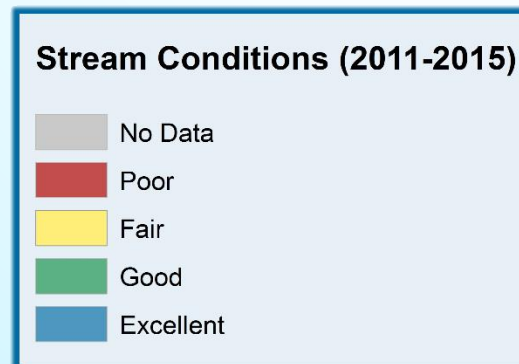
Habitat 101

Fish Cover/Bank Protection



Eroded/Incised Bank

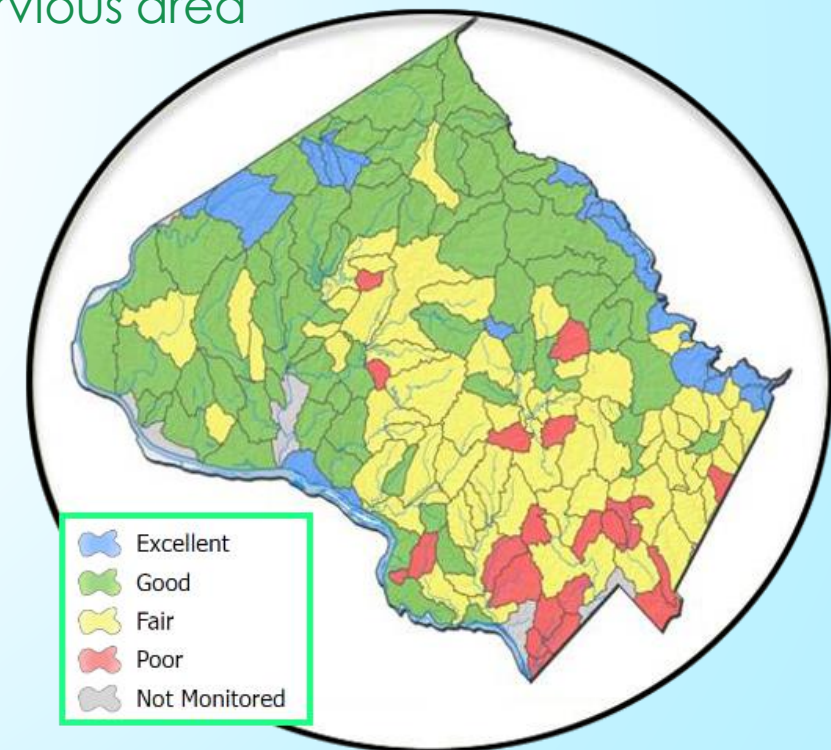
Monitoring



What is the County Doing to Protect Streams?



- Must meet regulatory requirements
 - MS4 permit – Municipal Separate Storm Sewer System
 - Provide treatment to 20% of County impervious area
- Watershed Restoration
 - Stream Restoration
 - Low Impact Development
 - Stormwater Pond Retrofits
 - RainScapes/Private Property Projects
- Monitoring/Evaluation
- Education and Outreach
- Special Protection Areas/Planning



Project Selection



- Located in a key watershed (Anacostia/Paint Branch Watershed) for stream restoration
- Erosion of banks threatening utilities and natural resources
- History of previous repairs
- Opportunity for water quality and ecological improvements
- Countywide Stream Protection Strategy and Lower Paint branch Watershed Study
- Anacostia River Watershed impaired for bacteria, PCBs, trash and debris, excess nitrogen and phosphorus, low dissolved oxygen, and excess sediment

Project Site



Existing Conditions



*Typical conditions of
Snowdens Mill channel in
lower reach downstream
of Serpentine Road*

Existing Conditions



Snowdens Mill typical conditions in the Middle Reach (between Serpentine Way and Falling Creek Court) showing routine erosion of channel banks and under floodplain root zone



Existing Conditions



*Eroded stream banks and
invasive plants in Snowdens
Mill Upper Reach (upstream of
Falling Creek Road*

Existing Conditions



Typical conditions of Falling Creek channel in lower reach downstream of Falling Creek Ct.

Existing Conditions



Routine erosion of channel banks and under floodplain root zone. Trees will eventually fall into the stream.

Existing Conditions



*Eroded stream banks, debris,
and invasive plants in Lower
Falling Creek Reach*

Existing Conditions



Channel migration to valley hill slope causing tree fall in lower section of Falling Creek (downstream of Falling Creek Court).

Restoration Goals



- Minimize natural resources impacts
- Improve aquatic & fish habitat
- Improve water quality
- Bed and bank stabilization
- Remove non-native invasive plants (vines/shrubs) within the stream LOD

Restoration Approach



➤ **Snowdens Mill**

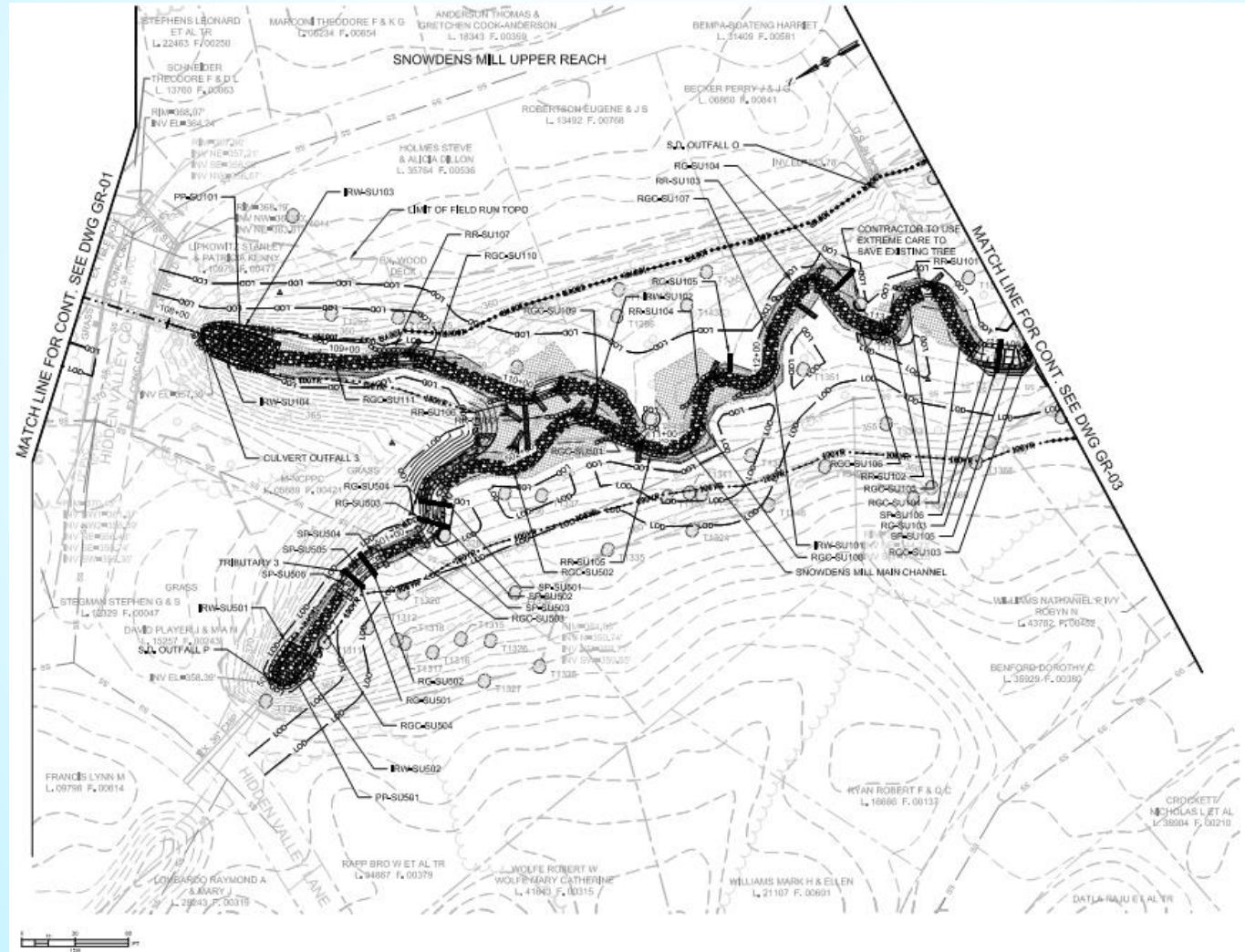
- Raise the existing stream bed elevation such that flood flows leave channel more-frequently to spread energy across floodplain
- Realign a portion of the channel in Snowdens Middle Reach (upstream of Serpentine Way) to prevent future erosion and tree fall
 - Create wetlands and wildlife habitat in abandoned channel

➤ **Lower Falling Creek**

- Lower floodplain elevations such that flood flows leave channel more-frequently to spread energy across floodplain
- Create riparian wetlands in the lowered floodplain that are highly-connected to groundwater

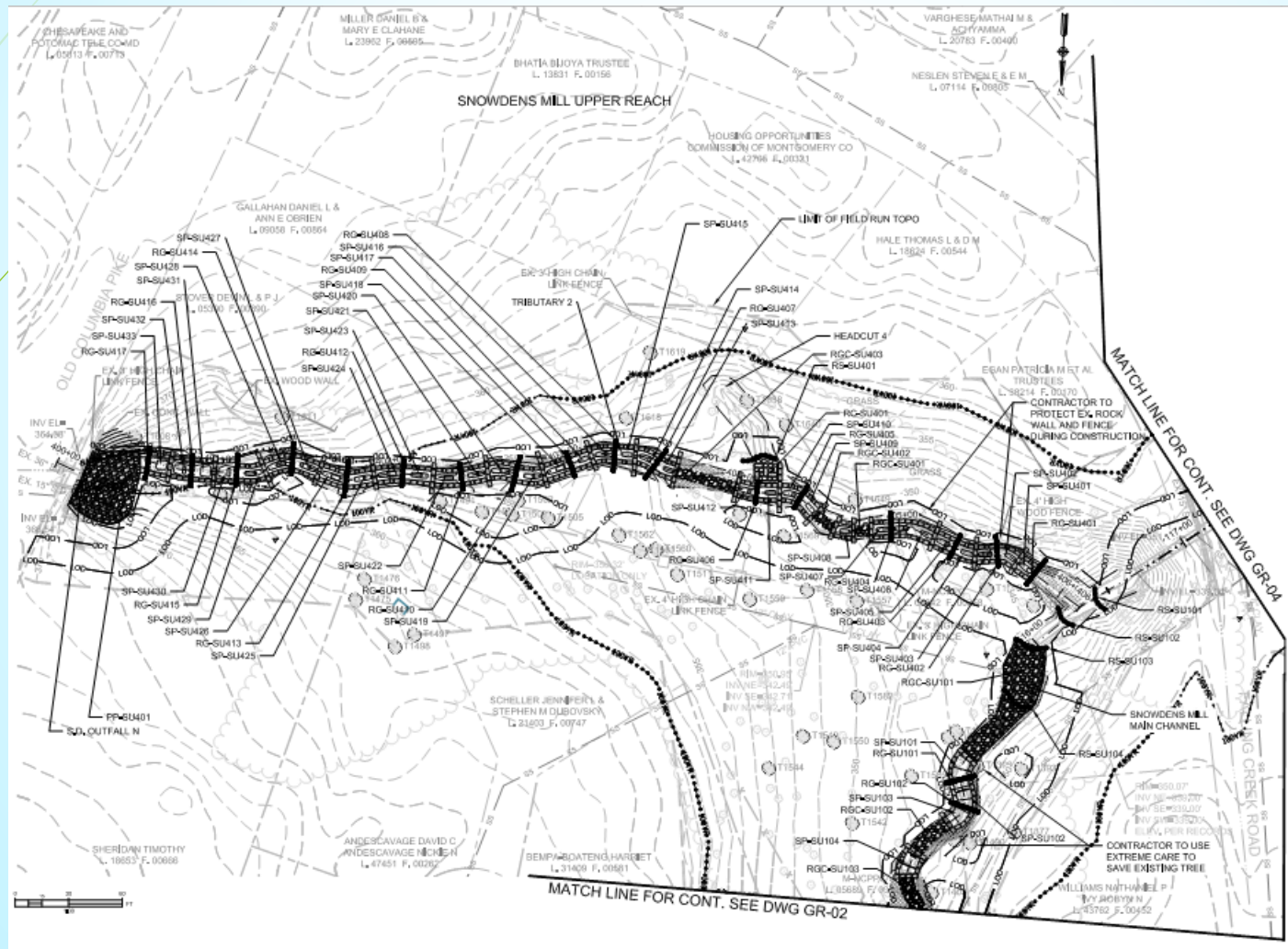
Stream Restoration Design

(02)- Snowdens Mill Upper Reach



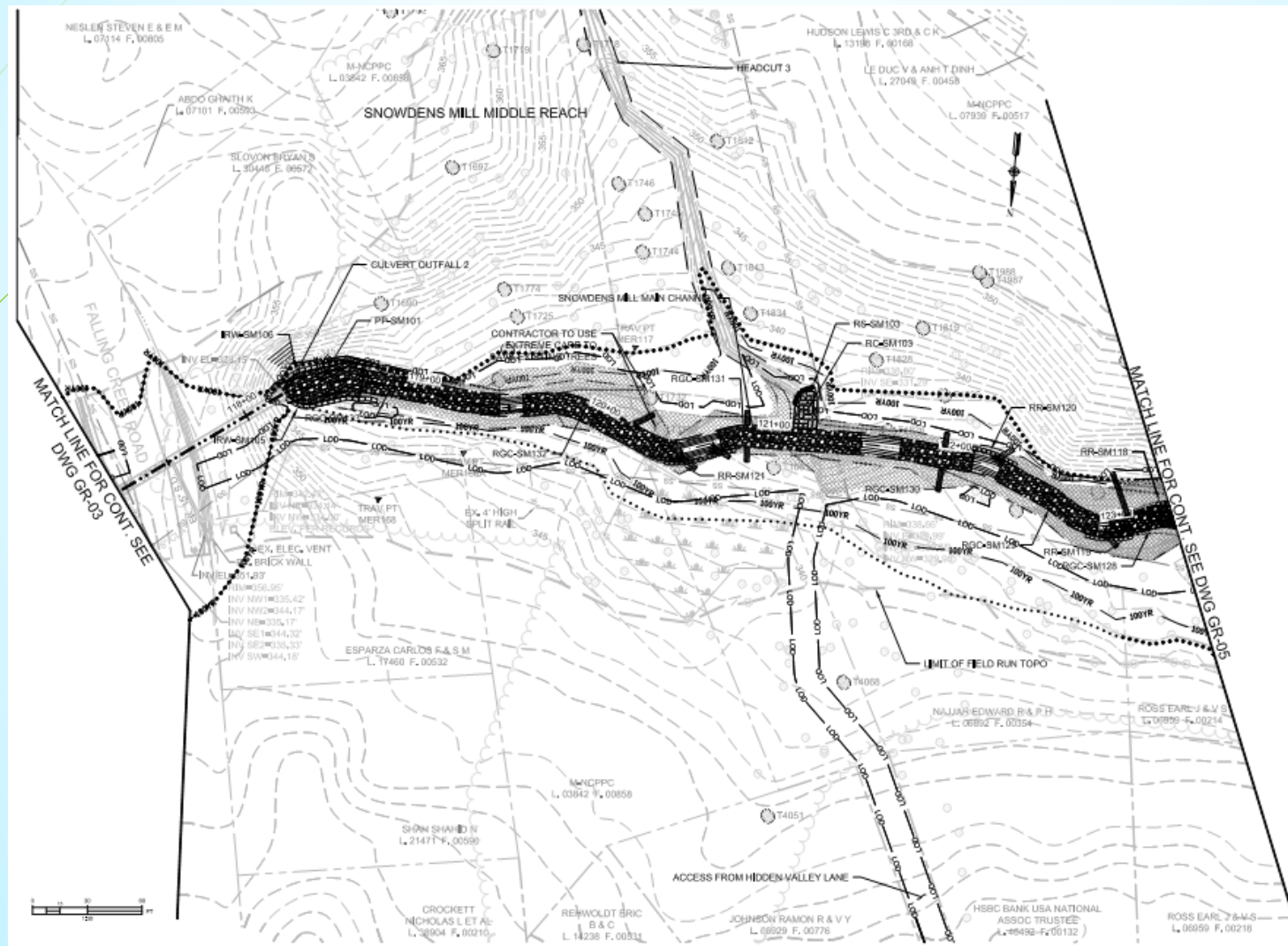
Stream Restoration Design

(03)- Snowdens Mill Upper Reach

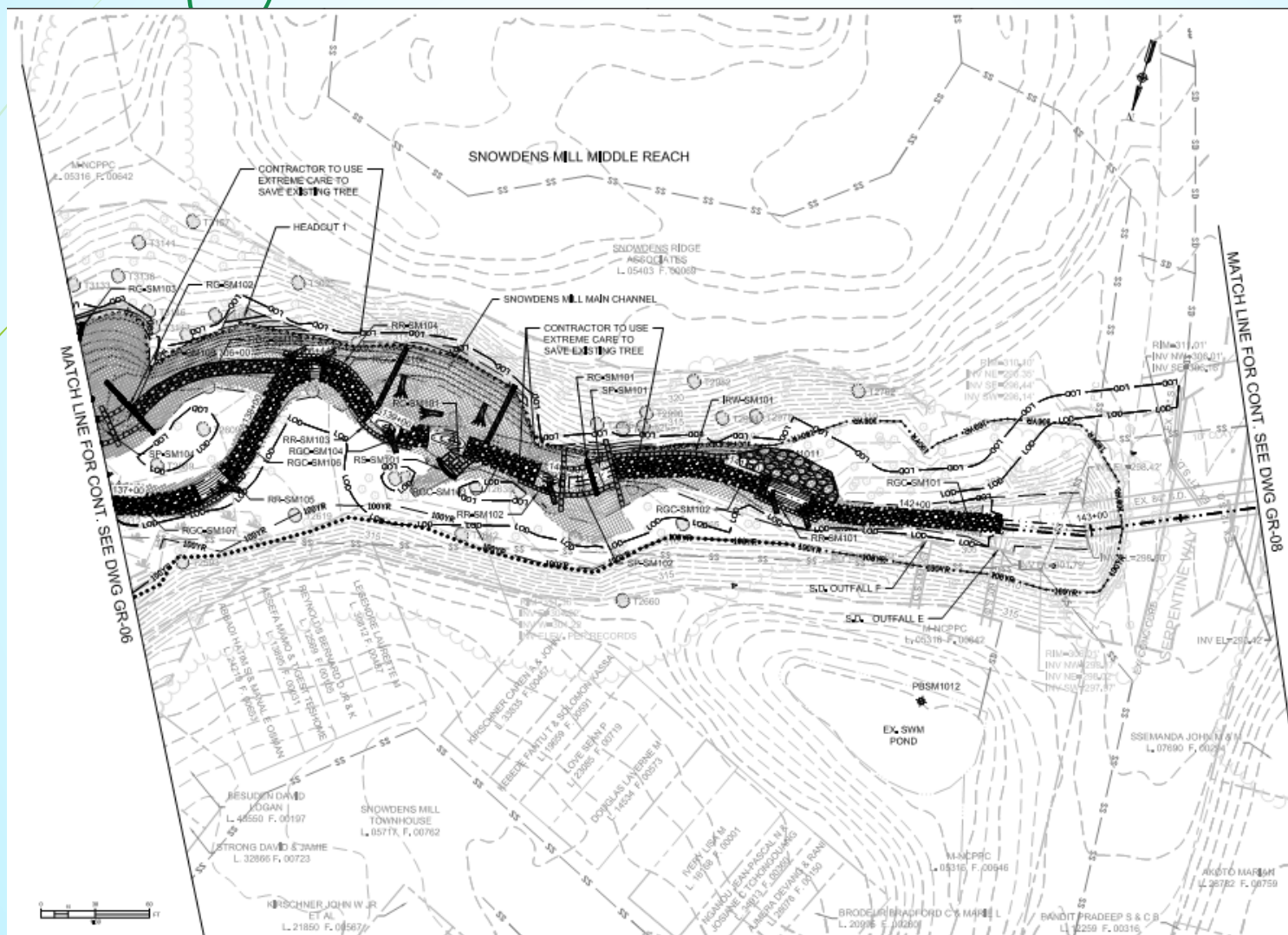


Stream Restoration Design

(04)- Snowdens Mill Middle Reach



(07)- Snowdens Mill Middle Reach

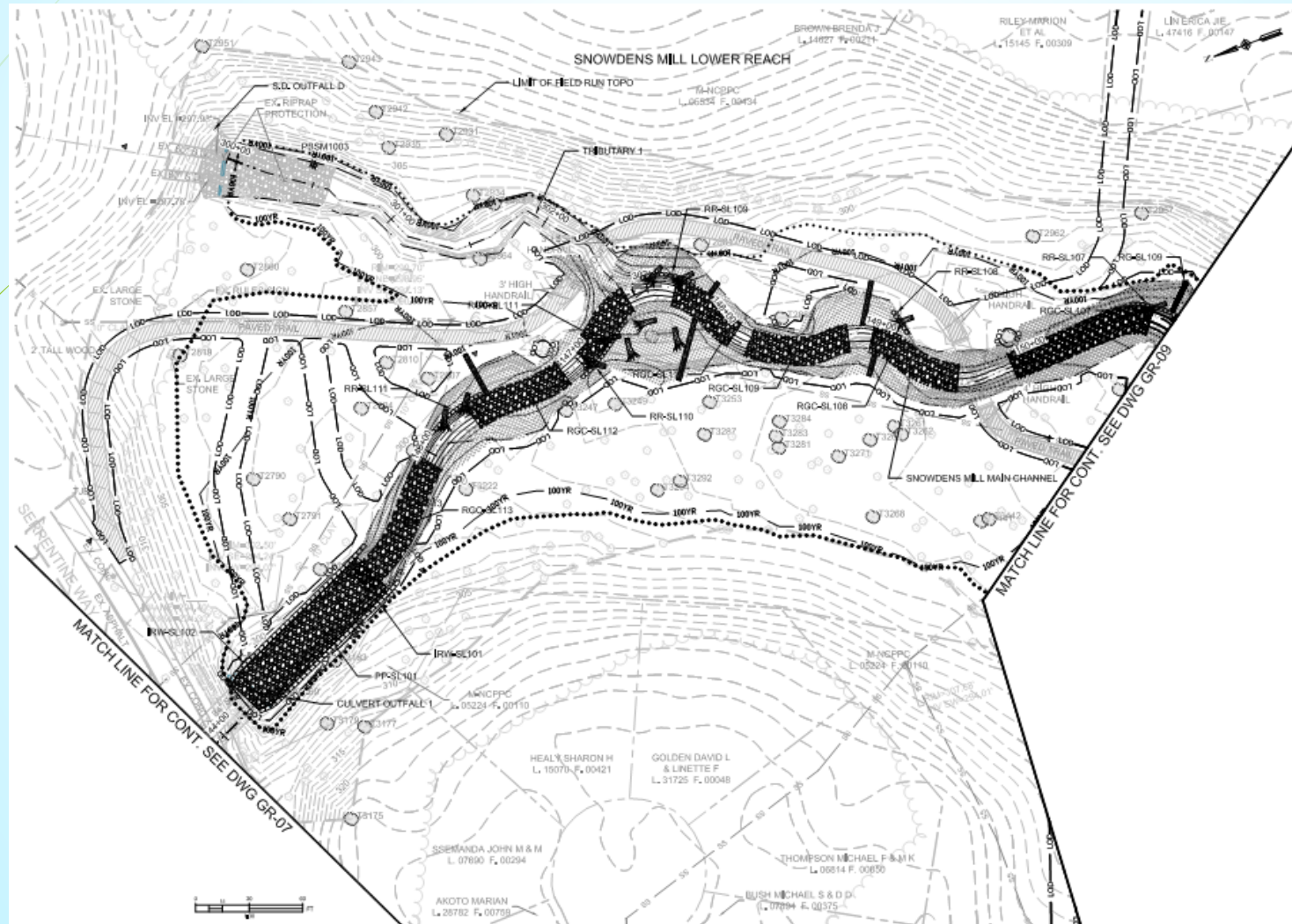


Stream Restoration Design

(08) – Snowdens Mill Lower Reach



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Riffle/Pool Sequence



Step Pool System



Imbricated Stone Wall



Toe Protection / Soil Lift



Log Grade Control



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Rock Ramp



Woody Debris/Wildlife Habitat



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Integrated Stream and Wetland System



Live Staking



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Plantings



Reforestation



Construction

What to expect



➤ **Duration**

- Approximately 6-12 months for each stream reach/area – phased over two years
- Class III In-Stream Construction Closure Period – **Oct 1-April 30**

➤ **Construction Hours – Monday – Friday 7 AM – 4 PM**

➤ **Safety**

- Open sides of site will be fenced with orange construction safety fence to separate construction from residents

➤ **Traffic**

- Minor impacts to traffic from entering and exiting construction traffic and contractor parking during the day – traffic control

➤ **Noise – Comply with Montgomery County Noise Ordinance**

➤ **Sediment – Comply with Montgomery County Sediment Control Permit**

Construction Entrances

EXAMPLE



During Construction



After Construction

Construction Entrances

Sod Replacement



Construction

Staging Area



Construction

Erosion Control



Construction

In-Stream



Construction

Traffic Impacts



Restoration Monitoring

- ▶ County monitoring to evaluate whether project goals are achieved will continue five years after project completion.
 - ▶ In-stream Habitat
 - ▶ Aquatic Insects
 - ▶ Fisheries



Project Schedule



- ▶ Public Meetings – December 5, 2017 / January 23, 2018
- ▶ Final Design Plans – Fall 2018
- ▶ Construction – Spring 2019 – Fall 2020
- ▶ Cost – estimated \$5,432,000 million financed by MCDEP CIP Program using funds generated through Water Quality Protection Charge

Questions?

For more information:

Miranda Reid 240-773-0802

Miranda.Reid@montgomerycountymd.gov

[https://www.montgomerycountymd.gov/water/
restoration/snowdens-mill-falling-creek.html](https://www.montgomerycountymd.gov/water/restoration/snowdens-mill-falling-creek.html)